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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,793	12/06/2001	Ramesh C. Kainthla	011221	9846

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT PAPER NUMBER

1745

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/006,793	Applicant(s) KAINTHLA ET AL.	
	Examiner Raymond Alejandro	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003 and 26 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 9-15 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-15 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This communication is in response to the amendments filed on 12/08/03 and 01/26/04.

The applicants have overcome the objections and the 35 USC 102 rejection. Refer to the abovementioned amendments for specific details on applicant's rebuttal arguments. However, the instant claims are finally rejected over the same art for the reasons of record:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Claims 1, 3-4, 9, 11-14 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese publication JP 11-339846 (hereinafter referred to as "*the JP '846 publication*").

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The instant application is directed to an anodic zinc electrode wherein the disclosed inventive concept comprises the specific Zn/ZnO weight ratio. Other limitations include the specific solubility modifiers; the hydrogen gas suppressant; the binding agent; in addition, the electrochemical cell per se and the method of manufacturing the same are claimed.

With respect to claims 1 and 9

The JP'846 publication teaches a sealed alkaline-zinc storage battery including a positive electrode (5) containing an active material; a separator (6), a negative electrode (7) and a negative current collector (4); an alkaline electrolyte; wherein the amount of an uncharged active material and zinc are to be packed in the negative electrode in manufacture of the sealed alkaline-zinc storage battery (ABSTRACT/SECTION 0027-0028). The JP'846 teaches a sealed alkaline zinc storage battery comprising an active material having reversibility in the charge and discharge reaction (ABSTRACT). *Hence, the electrodes are associated with an electrochemical cell including both a charged and/or discharged stated.*

The JP'846 publication further discloses the negative electrode including mixtures of zinc (Zn) and zinc oxide (ZnO) in various ratios. It is disclosed that the resultant mixture is kneaded to give a paste wherein the paste is applied and adhered onto an outer surface of a negative current collector (SECTION 0022).

Table 3 lists the amounts of zinc and zinc oxide among other constituents used in each battery (Section 0036/TABLE 3). Table 3 below as partly included herein shows the following:

電池	Zn (g)	ZnO (g)
本發明電池 A 1 3	1.5	2.5
本發明電池 A 3 1	1.5	1.5
本發明電池 A 3 2	1.5	1.0
本發明電池 A 3 3	1.5	0.5

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It is apparent from Table 3 above that the Zn/ZnO weight ratio for certain specific examples is as follows

- a) Battery A31: the Zn-to-ZnO weight ratio is 1:1 (for Battery A31);
- b) Battery A32: the Zn-to-ZnO weight ratio is 1.5:1 (for Battery A32);
- c) Battery A33, the Zn-to-ZnO weight ratio is 3:1 (for Battery A33).

In particular, the Zn/ZnO weight ratio of batteries Battery A32 is 1.5:1 and Battery A33 is 3:1.

With respect to claims 3 and 11:

It is disclosed that the negative electrode can include an additive for increasing hydrogen overpotential in order to suppress the generation of a hydrogen gas during storage. Examples of the additive include: diindium trioxide (In_2O_3) (SECTION 0022).

With respect to claims 4 and 12:

It is disclosed that the mixture of the negative electrode contains carboxymethyl cellulose (CMF) and polytetrafluoroethylene (PTFE) (SECTION 0022).

With respect to claim 13:

It is disclosed that conventional sealed alkaline-zinc storage batteries uses as the positive electrode active material MnO_2 (*manganese dioxide*) (SECTION 0015, 0010).

With respect to claim 14:

It is disclosed an example of a material for the positive electrode includes hydroxide of nickel which has an $\alpha\text{-Ni}(\text{OH})_2$ crystal structure (SECTION 0016).

With respect to claims 23 (former claim 24):

The JP'846 publication discloses the preparation of negative electrode includes mix zinc (Zn) and zinc oxide (ZnO) in various ratios along with other constituents; wherein the resultant

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mixture was kneaded to give a paste; wherein the paste was applied and adhered under pressure onto an outer surface of a negative current collector (SECTION 0022). The JP'846 also teaches a sealed alkaline zinc storage battery comprising an active material having reversibility in the charge and discharge reaction (ABSTRACT). *Hence, the electrodes are associated with an electrochemical cell including both a charged and/or discharged stated.*

The proportions of the total amounts of all of the negative electrode constituents are illustrated in Tables 1-3. In particular, Table 3 shows the following:

【表3】

電池	Zn (g)	ZnO (g)
本發明電池 A 1 3	1.5	2.5
本發明電池 A 3 1	1.5	1.5
本發明電池 A 3 2	1.5	1.0
本發明電池 A 3 3	1.5	0.5

It is apparent from Table 3 above that the Zn/ZnO weight ratio for certain specific examples is as follows

- a) Battery A31: the Zn-to-ZnO weight ratio is 1:1 (for Battery A31);
- b) Battery A32: the Zn-to-ZnO weight ratio is 1.5:1 (for Battery A32);
- c) Battery A33, the Zn-to-ZnO weight ratio is 3:1 (for Battery A33).

In particular, the Zn/ZnO weight ratio of batteries Battery A32 is 1.5:1 and Battery A33 is 3:1.

The JP'846 teaches a sealed alkaline zinc storage battery comprising an anode material according to the foregoing. However, the applied prior art does not expressly disclose the specific Zn-to-ZnO weight ratio ranging from greater than 1.5-2 to approximately 1.

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In light of this disclosure, it would have been obvious to one skilled in the art at the time the invention was made to use the specific Zn-to-ZnO weight ratio ranging from greater than 1.5-2 to approximately 1 in the anodic zinc electrode of the JP'846 publication because the JP'846 publication teaches specific Zn-to-ZnO weight ratios ranging from 1.5:1 to 3:1. Accordingly, in this case, a prima facie case of obviousness does exist because: i) the claimed range lies inside the range disclosed by the prior art; ii) the language recited in the present claims "to approximately 1" allows for magnitudes either slightly above or below 1 (*i.e. slightly greater or lower than 1*), and hence, the disclosed range overlaps (*e.g. 1.5 g of Zn and 1.01 g of ZnO results in a Zn-to-ZnO ratio of 1.48*); iii) assuming the claimed range strictly covers a range from greater than 1.5-2 (*i.e. $1.5 < \text{Zn/Zn ratio} \leq 2$*), a prima facie case of obviousness exist because although the claimed range and the prior art range do not overlap, they are close enough that one skilled in the art would have expected them to have the same properties. For this reason, this prior art reference teaching a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness. *In re Geisler* 42 USPQ2d 1362. *In re Peterson* 65 USPQ2d 1379. *Banner* 227 USPQ 773. *See MPEP 2144.05 [R-1] Obviousness of Ranges.*

4. Claims 2-3 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication JP 11-339846 as applied to claims 1 and 9 above, and further in view of Charkey 5460899.

The JP'846 publication is applied, argued and incorporated herein for the reasons above. However, the JP'846 publication does not disclose the specific zincate solubility modifier; and

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the specific hydrogen gas suppressant (*as applicable to the recited MARKUSH group in claims 3, 7, 11 and 18*).

With respect to claims 2 and 10:

Charkey discloses a sealed zinc secondary battery and zinc electrode therefor (TITLE) wherein the zinc negative electrode comprises a zinc active material and Ca(OH)_2 (ABSTRACT/ COL 1, line 62 to COL 2, line9). It is disclosed that Ca(OH)_2 is added to the zinc active material to reduce the solubility of the active material (col 1, lines 34-42/ COL 2, lines 10-16).

With respect to claims 3 and 11:

Charkey also discloses that the zinc negative electrode comprises a metallic matrix formed from a metallic oxide more electropositive than zinc; and useable metallic oxide materials are PbO , CdO and Bi_2O_3 among others (COL 2, line 62 to COL 3, line 3). *These claims are further rejected herein in order to address the limitations of the recited MARKUSH group.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to add the specific zincate solubility modifier of Charkey in the zinc negative active material of the JP'846 publication as Charkey teaches that by adding such modifier the shape change of the zinc negative electrode is reduced due to the production of calcium zincate which remains thermodynamically stable and substantially insoluble as a result of the electrolyte concentration. Thus, the additive Ca(OH)_2 is added to the zinc active material to reduce the solubility of the active material Moreover, the zinc negative electrode retains its conductivity in spite of electrolyte constituents due to its conductive matrix. Accordingly, it provides a zinc negative electrode and zinc secondary battery with reduced shape change and solubility of the zinc electrode and increased cycle life for the battery.

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As to the specific hydrogen gas suppressant, it would have been obvious to one skilled in the art at the time the invention was made to add the specific hydrogen gas suppressant of Charkey in the zinc negative active material of the JP'846 publication as Charkey teaches that zinc negative electrodes comprise a metallic matrix formed from the specific metallic oxide more electropositive than zinc. Accordingly, the specific compounds are useable metallic oxide materials which are more electropositive than zinc and are easily reduced to metal during charging without lowering the hydrogen overpotential of the respective electrode.

5. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication JP 11-339846 as applied to claim 9 above, and further in view of the Japanese publication JP 62-143368.

The JP'846 publication is applied, argued and incorporated herein for the reasons above. However, the JP'846 publication does not expressly disclose the cathodic electrode comprising silver-oxide.

As to claim 15 :

The JP'368 publication discloses an alkaline-zinc storage battery wherein silver oxide is added to manganese dioxide to make a positive active material (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the cathodic electrode comprising silver-oxide of the JP'368 publication in the electrochemical cell of the JP'846 publication because the JP'368 publication teaches that by using silver oxide as part of the positive active material in an alkaline zinc storage battery, a battery that is excellent in a pressure proof characteristic is obtained.

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Accordingly, the silver oxide provides an excellent charging characteristic along with the pressure proof characteristic, and hence, an enhanced or more controlled voltage and charging current characteristic in the battery system is obtained. Further, the generation of oxygen from the positive electrode during charge can be suppressed.

Response to Arguments

6. Applicant's arguments, see the amendments filed 12/08/03 and 01/26/04, with respect to the rejection(s) of claim(s) 1-4, 9-15 and 23 have been fully considered and are persuasive.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made as seen above.

7. Although not necessary due to the new ground of rejection, the examiner likes to briefly address the following arguments:

a) inasmuch as the JP'846 publication teaches specific Zn-to-ZnO weight ratios ranging from 1.5:1 to 3:1, a prima facie case of obviousness does exist because: i) the claimed range lies inside the range disclosed by the prior art; ii) the language recited in the present claims "to approximately 1" allows for magnitudes either slightly above or below 1 (*i.e. slightly greater or lower than 1*), and hence, the disclosed range overlaps (*e.g. 1.5 g of Zn and 1.01 g of ZnO results in a Zn-to-ZnO ratio of 1.48*); iii) assuming the claimed range strictly covers a range from greater than 1.5-2 (*i.e. $1.5 < \text{Zn/Zn ratio} \leq 2$*), a prima facie case of obviousness exist because although the claimed range and the prior art range do not overlap, they are close enough that one skilled in the art would have expected them to have the same properties. For this reason, this prior art reference teaching a range encompassing a somewhat narrower claimed range is sufficient to

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establish a prima facie case of obviousness. *In re Geisler* 42 USPQ2d 1362. *In re Peterson* 65 USPQ2d 1379. *Banner* 227 USPQ 773. *See MPEP 2144.05 [R-1] Obviousness of Ranges*. In this regard, it is further contended that the submission of objective evidence of patentability does not automatically mandate a conclusion of patentability in and of itself. Although the record may establish evidence of secondary considerations which might be indicia of nonobviousness, the actual record establishes such a strong case of obviousness that the objective evidence of nonobviousness is not sufficient to outweigh the evidence of obviousness. Accordingly, a prima facie case of obviousness cannot be simply rebutted by merely recognizing additional advantages or latent properties present in the prior art. Moreover, applicants must further show that the results were greater than those which would have been expected from the prior art to an unobvious extent, and that the results are of a significant and practical advantage.

b) as to the specific amount of the compounds $\text{Be}(\text{OH})_2$, $\text{Mg}(\text{OH})_2$, $\text{Ca}(\text{OH})_2$, $\text{Sr}(\text{OH})_2$, $\text{Ba}(\text{OH})_2$, $\text{Ra}(\text{OH})_2$, it is noted that the present claims are silent regarding any particular amount of the foregoing compounds used in the zinc electrode. Thus, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e., the particular amount of the foregoing compound being 12 % w/w or 14 % w/w*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *See In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

c) with specific reference to the unexpected results (*emphasis added*), it is noted that the foregoing performance characteristic of the exemplified anodic zinc electrode does not reflect or correspond to the performance characteristic of the claimed zinc electrode because the objective

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evidence of nonobviousness is not commensurate in scope with the instant claims which the evidence is offered to support. For instance, it is noted that the data of EXPERIMENT 1, 2 and 4 showing *an excellent rechargeability* does not evidence unexpected results for the entire claimed range of greater than 1.5 – 2 to approximately 1 because as apparent from EXPERIMENTS 1, 2 and 4, significant rechargeability is reached at Zn-to-ZnO weight ratios of 2:1 (EXPERIMENT 1 and 4) and 1.98:1 (EXPERIMENT 3) (not in the entire weight ratio ranging from greater than 1.5-2 to approximately 1 as instantly claimed). Therefore, it is contended that the objective evidence of nonobviousness is not commensurate in scope with the present claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

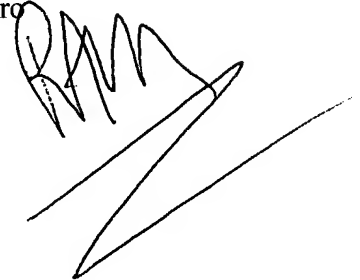
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
Art Unit 1745

A handwritten signature in black ink, appearing to read 'RAM', followed by a long, sweeping horizontal line that extends to the right.